R E M A R K S

Information Disclosure Statement

The Examiner is respectfully requested to return copies of the IDS Forms filed on August 12, 2008, with the Examiner's initials in the left column next to each cited publication to indicate that all the cited publications were considered and made of record.

Presently Claimed Invention

The presently claimed invention pertains to a sputtering target consisting essentially of a binary alloy including Cu and Mo in an amount of 0.1 to 3.0% by weight (see applicant's claim 2).

The presently claimed invention also relates to an electronic component having a wiring pattern, an electrode or a contact using a metallic material, said metallic material formed by a sputtering process using a sputtering target consisting essentially of a binary alloy including Cu and Mo in an amount of 0.1 to 3.0% by weight (see applicant's claim 9).

The presently claimed invention is also directed to an electronic device having a wiring pattern, an electrode or a contact using a metallic material, said metallic material formed by a sputtering process using a sputtering target consisting essentially of a binary alloy including Cu and Mo in an amount of 0.1 to 3.0% by weight (see applicant's claim 18).

The presently claimed invention also concerns an electronic optical component having reflective film, an electrode or a wiring pattern which are formed by a metallic film formed by a sputtering process using a sputtering target consisting essentially of a binary alloy including Cu and Mo in an amount of 0.1 to 3.0% by weight (see applicant's claim 45).

Obviousness Rejections under 35 USC 103

1. Claims 2, 9, 18 and 45 were rejected under 35 USC 103 as being unpatentable over USP 4,818,283 to Grunthaler et al.; Xiao et al., Scripta Mettalurgica et Materialia, Vol. 32, No. 3, pp. 353-358 (1995) or Chu et al., Journal of Applied Physics, Vol. 85, No. 9, 6462-6469 (1999) for the reasons set forth on pages 2 to 4 of the Office Action.

2. Claims 2, 9, 18 and 45 were rejected under 35 USC 103 as being unpatentable over the "acknowledged prior art admission" in view of USP 4,818,283 to Grunthaler et al., Xiao et al. or Chu et al. for the reasons beginning at the middle of page 4 and continuing to the top of page 5 of the Office Action.

It as admitted in the Office Action that the "acknowledged prior art admission" does not disclose a Cu-Mo alloy metallic contact.

Applicant's Rebuttal to the obviousness Rejections

All of applicant's present claims are directed to a sputtering target consisting essentially of a binary alloy including Cu and Mo. A sputtering target is an origin material used for producing a thin film. The thickness of the thin film is extremely thin. It is hundreds of nanometers to several nanometers. Therefore, when the sputtering target is a binary alloy including Cu and Mo, it is necessary to have Mo dispersed extremely uniformly in Cu.

Stated differently, inherent features of "a sputtering target consisting essentially of a binary alloy" are (i) Mo being

uniformly dispersed in Cu and (ii) sputtering is used to produce a very thin film. This is what a person having ordinary skill in the art would know.

If Mo is not uniformly dispersed in Cu, a person of ordinary skill in the art would know that the characteristic of a thin film worsens.

USP 4,818,283 (Grunthaler et al.) describes a process for producing a copper alloy which includes admixing to a copper melt from 0.3 to 15 weight % Mo to provide a mixture and superheating the mixture to a temperature ranging from about 200°C to about 1000°C above the melting point of copper to provide a superheated melt.

USP 4,818,283 does not mention a sputtering target at all. Also since a sputtering target is for producing a thin film, the product described in USP 4,818,283 is completely different from a sputtering target as recited in applicant's claims.

In USP 4,818,283, Mo is not uniformly dispersed in the copper alloy. Because the binary alloy in USP 4,818,283 including Cu and Mo is not a solid solution, segregation of Mo exists in the copper alloy.

If a binary alloy including Cu and Mo is a solid solution, Mo would be uniformly dispersed in the copper alloy manufactured by the method described in USP 4,818,283. However, since in USP 4,818,283, the binary alloy including Cu and Mo is not a solid solution, Mo is not uniformly dispersed in the copper alloy manufactured by the method described in USP 4,818,283. This is what a person having ordinary skill in the art would know.

Stated differently, since in USP 4,818,283, a binary alloy including Cu and Mo is not a solid solution and since Mo must be uniformly dispersed in a sputtering target consisting essentially of a binary alloy including Cu and Mo, therefore, a sputtering target consisting essentially of a binary alloy including Cu and Mo cannot be manufactured by the method described in USP 4,818,283.

Applicant's present claim 2 is therefore considered to be patentable over USP 4,818,283, alone or combined with the other references (such other references being discussed hereinbelow).

Chu et al. describe co-sputtering a Mo target (99.95% pure) overlaid with a Cu plate (99.9% pure) on page 6462, left column, lines 1 to 4 of the "Experimental Procedure." Therefore, Mo is

not uniformly dispersed in the co-sputtering target described in Chu et al.

Chu et al. disclose the resistivity of a thin film consisting of an alloy including Cu and Mo in an amount of 2 at% (2.98% by weight) (see Fig. 11 on page 6467 of Chu et al.). However, the resistivity of the thin film is a mistake. Fig. 11 on page 6467 of Chu et al. shows that the resistivity of the thin film consisting of an alloy including Cu and Mo in an amount of 2 at% (2.98% by weight) is lower than the resistivity of a thin film consisting of pure Cu. A person having ordinary skill in the art would know this is impossible. Actually, the resistivity of a thin film consisting of an alloy including Cu and Mo in an amount of 2 at% (2.98% by weight) is higher than the resistivity of a thin film consisting of pure Cu.

The reasons why such a mistake occurred is that (i) the target of Chu et al. involves co-sputtering with separate Cu and Mo targets and (ii) Mo is not uniformly dispersed in the co-sputtering target of Chu et al.

Mo is not uniformly dispersed in the thin film formed with the co-sputtering target of Chu et al. The thin film partially

contains pure Cu.

Xiao et al. describe a sputtering target which is produced by attaching pieces of pure Cu foil to Mo target (see page 353, lines 1 to 5 of the "Experimental Procedures"). Ths means that Xiao et al. disclose a co-sputtering with separate Cu and Mo targets. Mo is not uniformly dispersed in thin film formed with the co-sputtering target in Xiao et al. The thin film in Xiao et al. partially contains pure Cu.

The above means that Xiao et al. and Chu et al. disclose a co-sputtering with separate Cu and Mo targets. Xiao et al. and Chu et al. do not disclose a sputtering target consisting essentially of a binary alloy including Cu and Mo as recited in applicant's present claim 2.

Applicant's present claim 9 recites a wiring pattern, an electrode or a contact formed by a sputtering target consisting essentially of a binary alloy including Cu and Mo.

As discussed herein above, USP 4,818,283 does not mention a sputtering target at all.

As discussed above, Xiao et al. and Chu et al. disclose a co-sputtering with separate Cu and Mo targets, but do not

disclose or suggest a sputtering target consisting essentially of a binary alloy including Cu and Mo as recited in applicant's claim 9. Thus, Xiao et al. and Chu et al. do not teach or suggest a wiring pattern, an electrode or a contact formed by a sputtering target consisting essentially fo a binary alloy including Cu and Mo, as recited in applicant's claim 9. Further, a sputtering target consisting essentially of a binary alloy including Cu and Mo as recited in applicant's claim 9 produces a Cu-Mo alloy thin film with a stable composition compared to the co-sputtering of Xiao et al. and Chu et al.

It is thus respectfully submitted that applicant's claim 9 is patentable over the cited references.

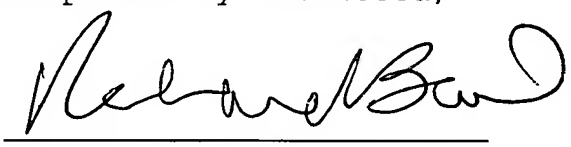
Applicant's present claims 18 and 45 are also submitted to be patentable over the cited references for the same reasons discussed above with respect to applicant's present claim 9.

Withdrawal of each of the 35 USC 103 rejections is thus respectfully requested.

Reconsideration is requested. Allowance is solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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